

THE GLOBAL EXPERT  
IN **SOLID STATE**  
**POWER SWITCHING**  
TECHNOLOGY



■ Food Preparation Equipment



■ Petrochemical



■ HVAC

**RHP**  
Series



**CST**  
CUSTOM SENSORS & TECHNOLOGIES

**crydom**<sup>®</sup>  
Hybrid Solid State Contactors

# crydom®

**C**rydom has a distinguished record of providing advanced, high quality products with timely delivery and competitive pricing. Your success in today's fastpaced global markets hinges on working with suppliers who respond quickly and appropriately to your every need.

In addition to an extensive selection of catalog off-the-shelf items, Crydom offers custom-designed solid state relays. Fact is we specialize in satisfying the most demanding environmental and performance requirements our customers can devise. Give us your specs, and watch us exceed your expectations!

At Crydom's custom-built **100,000 square foot manufacturing facility**, virtually everything is accomplished in-house to assure complete control over delivery, production, and above all quality. With design, development, manufacturing and management personnel

under one roof, we're geared for fast response to your requirements.

In **Design Engineering**, we focus on pushing performance, reliability and quality standards ever higher. Working under a conservative design and rating philosophy, Crydom's seasoned engineering team makes extensive use of CAD to optimize design of mechanical parts.

As a result of these efforts, Crydom has acquired an impressive list of patents in solid state relay technology, while continuing to create new circuit and technology-related inventions as part of our ongoing R & D programs.

Once the design is solidified, **Production Engineering** is responsible for the engineering

control of the techniques used throughout manufacturing. This department works closely with our design engineering group, establishes assembly processes, and oversees a comprehensive on-premises machine shop which fabricates our assembly fixtures.

As the work progresses, **Material and Production Control** employ our advanced computer system, upgraded with our customized software to keep manufacturing operations humming. The computer system employs integral MRP and MSP capabilities to generate detailed scheduling and planning information.

**Ceramic Hybrid Manufacturing** also is performed in-house. Crydom manufactures all metallized ceramic substrates used in our relays — a major factor in product performance and reliability, including direct bond copper substrates.



[www.crydom.com](http://www.crydom.com)

**Quality Assurance** conducts ongoing product reliability verification tests, gathering precise data on the quality of our power semiconductor vendors and the silicon chips they provide. Additional tests are performed to meet specific customer burn-in requirements.

Crydom tests are exhaustive, including **100% verification** at final test. After units are completely assembled, they must pass a complete set of electrical tests, which are performed twice, once prior to encapsulation and then again afterward.

Because of our dedication to quality, Crydom was one of the first American companies to achieve full certification to the demanding standards of ISO 9001. In addition, most Crydom products are approved by UL, CSA, VDE, TUV and carry the CE Mark signifying conformance with the latest European directives. Certain panel mount and din rail mount relays carry UL 508A SCCR ratings.

Learn how an alliance with the world leader in solid state relays can pay off for you. For details, call your authorized Crydom distributor today.



## RHP Series

### What is a Hybrid Solid State Contactor?

Crydom has combined solid state and mechanical switching technologies to create its line of **Hybrid Solid State Contactors**. The **RHP** contactors (*patent pending*) provide the performance advantages of both technologies in an industry standard DP contactor package. Crydom's proven Hybrid SSR technology utilizes contactless solid state turn on and turn off performance, coupled with the very low on state power dissipation characteristic of contactors. This combination results in a fast switching highly reliable contactor that does not require the use of a heat sink.

Available in single and 3 phase versions, **Hybrid Solid State Contactors** are a cost effective alternative to Mercury Displacement Relays (MDR). **RHP** contactors are safe and comply with industry standards while offering high power switching capabilities.

### What are the advantages of the RHP contactors?

- They are the perfect "mercury-free alternative" to replace MDRs
- 40 & 50 Amp versions in an industry standard DP contactor package for easy replacement in existing applications
- Highly reliable and longer operation life than standard EMRs
- DC logic compatible input available
- No heat sink requirement reduces panel space and overall system cost

### Typical Applications

#### Food Industry Equipment

Baking ovens  
Coffee urns  
Deep fryers  
Electric grills  
Pizza ovens

#### Electric Heaters

Quartz heaters  
Radiant heaters  
Plastic extruders  
Packaging equipment  
Drying ovens  
Heat sealing machines  
Injection molding machines  
Laboratory ovens

#### Lighting

Tungsten lamps  
Pool heaters  
Infrared heaters  
Tower lights  
Heat lamps



## 3 Phase Contactor AC Input

40-50 Amp  
280/600 VAC

PATENT  
PENDING

- Combined SSR and EMR advantages
- Lifetime >2 million operations @ full load
- No heat sink required
- Input status LED indicator
- Wire, lug or quick connect termination
- DP contactor footprint
- CE compliant, UL/cUL recognized
- 100k-cycle UL508 endurance rating

### CONTROL SPECIFICATIONS<sup>Ⓢ</sup>

Control Voltage Suffix	E	F	G
Coil Voltage Range	20 - 26 VAC, 50/60 Hz	100 - 130 VAC, 50/60 Hz	208 - 240 VAC, 50/60 Hz
Min. Turn-On Voltage	20 VAC	100 VAC	208 VAC
Min. Turn-Off Voltage	12 VAC	24 VAC	48 VAC
Coil Power Consumption, Inrush	56 VA @ 24 VAC	56 VA @ 120 VAC	56 VA @ 220 VAC
Coil Power Consumption, Sealed	6.6 VA @ 24 VAC	6.6 VA @ 120 VAC	6.6 VA @ 220 VAC
Coil Terminals	10 in lb (1.13 Nm)	10 in lb (1.13 Nm)	10 in lb (1.13 Nm)

### OUTPUT SPECIFICATIONS<sup>Ⓢ</sup>

Voltage suffix	28	60
Operating Voltage (50/60Hz)	24 - 280 VAC	48 - 600 VAC
Maximum Off-State Leakage Current per channel <sup>Ⓢ</sup>	0.05 mA @ 240 VAC	0.06 mA @ 480 VAC
Load Current suffix	40	50
Maximum Load Current per Phase @ 40°C <sup>Ⓢ</sup>	40 A Resistive	50 A Resistive
Power terminals / wire range	Dual quick connect and Binder head screws / AWG#14 - AWG#8	Dual quick connect and Box lugs / AWG#14 - AWG#6
Screw torque requirements	15-18 in lbs (1.7-2.1 Nm)	20-25 in lbs (2.2-2.9 Nm)

### GENERAL SPECIFICATIONS<sup>Ⓢ</sup>

Input to Output Dielectric Isolation	4000 VAC
Input/Output to Ground Dielectric Isolation	2500 VAC
Contacts (Double Break) <sup>Ⓢ</sup>	Three Normally Open
Ambient Operating Temperature Range <sup>Ⓢ</sup>	-20°C to 75°C
Ambient Storage Temperature Range	-40°C to 100°C
Max. Turn-On Time	16.6 mS @ 60 Hz / 20 mS @ 50 Hz
Max. Turn-Off Time	32 mS @ 60 Hz / 40 mS @ 50 Hz
Maximum Number of Operations per Minute	30 operations per min
Lifetime @ Rated Load Current, 40°C ambient temp, 30 operations/min, Rated Vcontrol	> 2 Million operations
Weight (typical)	540 grs (1.19 lb)

- Ⓢ Specifications @ 25°C unless otherwise noted.
- Ⓢ See Derating Curves for additional operational conditions.
- Ⓢ The RHP includes a Solid-State Relay. Therefore, the output is never completely open.
- Ⓢ The RHP includes an overtemperature protection for the Solid-State Module.

AC Input	Operating Voltage	Load Current	Control Voltage
	VAC 50/60 Hz	Amps rms	VAC 60 Hz
3RHP2840E	24-280	40	20-26
3RHP2840F	24-280	40	100-130
3RHP2840G	24-280	40	208-240
3RHP2850E	24-280	50	20-26
3RHP2850F	24-280	50	100-130
3RHP2850G	24-280	50	208-240
3RHP6040E	48-600	40	20-26
3RHP6040F	48-600	40	100-130
3RHP6040G	48-600	40	208-240
3RHP6050E	48-600	50	20-26
3RHP6050F	48-600	50	100-130
3RHP6050G	48-600	50	208-240



## 3 Phase Contactor DC Input

40-50 Amp  
120/240 VAC

PATENT  
PENDING

- Combined SSR and EMR advantages
- Lifetime >2 million operations @ full load
- No heat sink required
- DC logic compatible input
- Input status LED indicator
- Wire, lug or quick connect termination
- DP contactor footprint
- CE compliant, UL/cUL recognized
- 100k-cycle UL508 endurance rating

### CONTROL SPECIFICATIONS<sup>Ⓢ</sup>

Control Voltage Suffix	D5	D12	D24
Control Voltage Range	4.5 - 5.5 VDC	10 - 15 VDC	22 - 27 VDC
Max. Reverse Voltage	-5.5 VDC	-15.5 VDC	-27.5 VDC
Min. Turn-On Voltage	4.5 VDC	9.5 VDC	9.5 VDC
Min. Turn-Off Voltage	1 VDC	2 VDC	2 VDC
Input Current	12mA @ 5 VDC	12mA @ 12 VDC	12mA @ 24 VDC
Input Connector	5.31 in lb (0.6 Nm)	5.31 in lb (0.6 Nm)	5.31 in lb (0.6 Nm)

### OUTPUT SPECIFICATIONS<sup>Ⓢ</sup>

Voltage suffix	12	24
Operating Voltage (50/60Hz)	100 - 120 VAC	208 - 240 VAC
Maximum Off-State Leakage Current per channel <sup>Ⓢ</sup>	0.05 mA @ 120 VAC	0.06 mA @ 240 VAC
Load Current suffix	40	50
Maximum Load Current per Phase @ 40°C <sup>Ⓢ</sup>	40 A Resistive	50 A Resistive
Power terminals / wire range	Dual quick connect and Binder head screws / AWG#14 - AWG#8	Dual quick connect and Box lugs / AWG#14 - AWG#6
Screw torque requirements	15-18 in lbs (1.7-2.1 Nm)	20-25 in lbs (2.2-2.9 Nm)

### GENERAL SPECIFICATIONS<sup>Ⓢ</sup>

Input to Output Dielectric Isolation	4000 VAC
Input/Output to Ground Dielectric Isolation	2500 VAC
Contacts (Double Break) <sup>Ⓢ</sup>	Three Normally Open
Ambient Operating Temperature Range <sup>Ⓢ</sup>	-20°C to 75°C
Ambient Storage Temperature Range	-40°C to 100°C
Max. Turn-On Time	16.6 mS @ 60 Hz / 20 mS @ 50 Hz
Max. Turn-Off Time	32 mS @ 60 Hz / 40 mS @ 50 Hz
Maximum Number of Operations per Minute	30 operations per min
Lifetime @ Rated Load Current, 40°C ambient temp, 30 operations/min, Rated Vcontrol	> 2 Million operations
Weight (typical)	540 grs (1.19 lb)

- Ⓢ Specifications @ 25°C unless otherwise noted.
- Ⓢ See Derating Curves for additional operational conditions.
- Ⓢ The RHP includes a Solid-State Relay. Therefore, the output is never completely open.
- Ⓢ The RHP includes an overtemperature protection for the Solid-State Module.

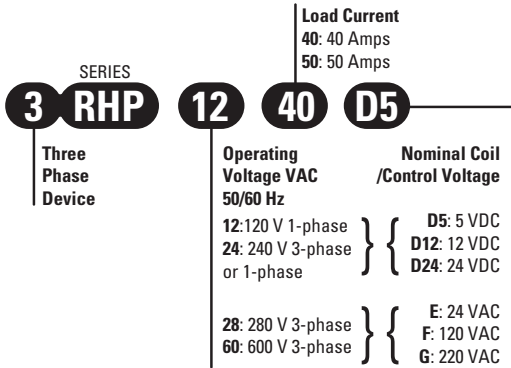
DC Input	Operating Voltage	Load Current	Control Voltage
	VAC 50/60 Hz	Amps rms	VDC
3RHP1240D12	100-120	40	10-15
3RHP1240D24	100-120	40	22-27
3RHP1240D5	100-120	40	4.5-5.5
3RHP1250D12	100-120	50	10-15
3RHP1250D24	100-120	50	22-27
3RHP1250D5	100-120	50	4.5-5.5
3RHP2440D12	208-240	40	10-15
3RHP2440D24	208-240	40	22-27
3RHP2440D5	208-240	40	4.5-5.5
3RHP2450D12	208-240	50	10-15
3RHP2450D24	208-240	50	22-27
3RHP2450D5	208-240	50	4.5-5.5

Questions? Call or e-mail

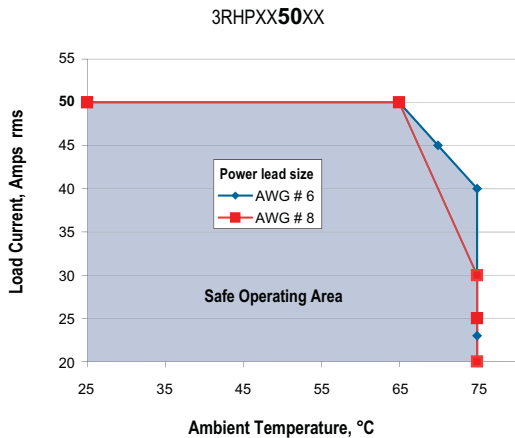
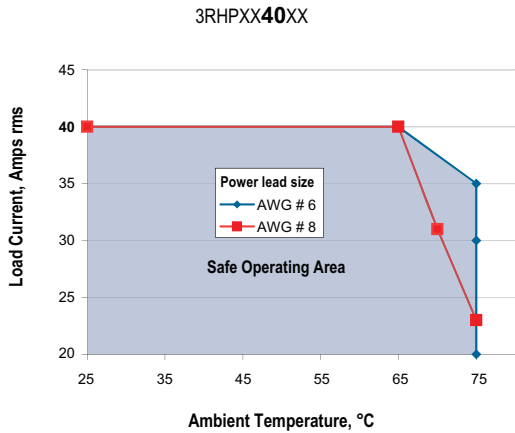
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## Part Number Nomenclature

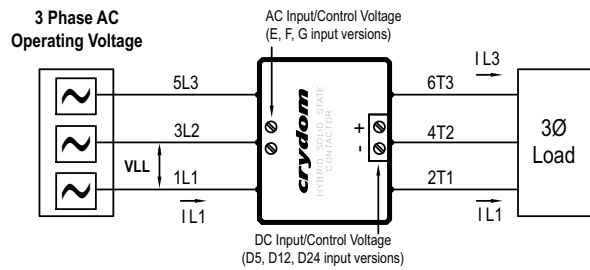


## Derating Curves



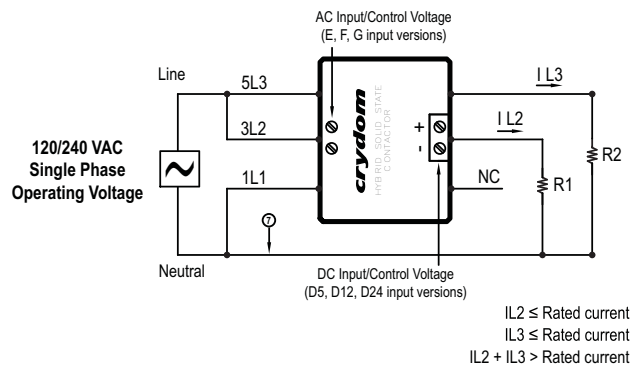
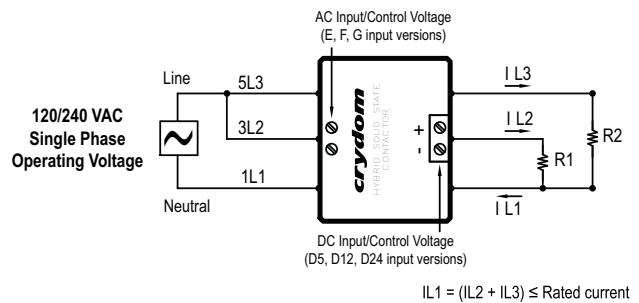
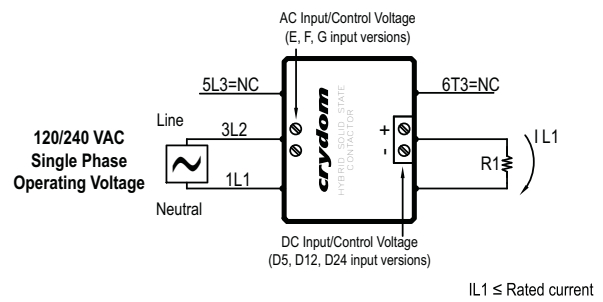
## Typical Electrical Connection for 3 Phase Applications<sup>Ⓞ</sup>

(For output voltage options 24, 28, 60)



## Optional Electrical Connections for Single Phase Applications<sup>Ⓞ</sup>

(For output voltage options 12, 24, 28, 60)

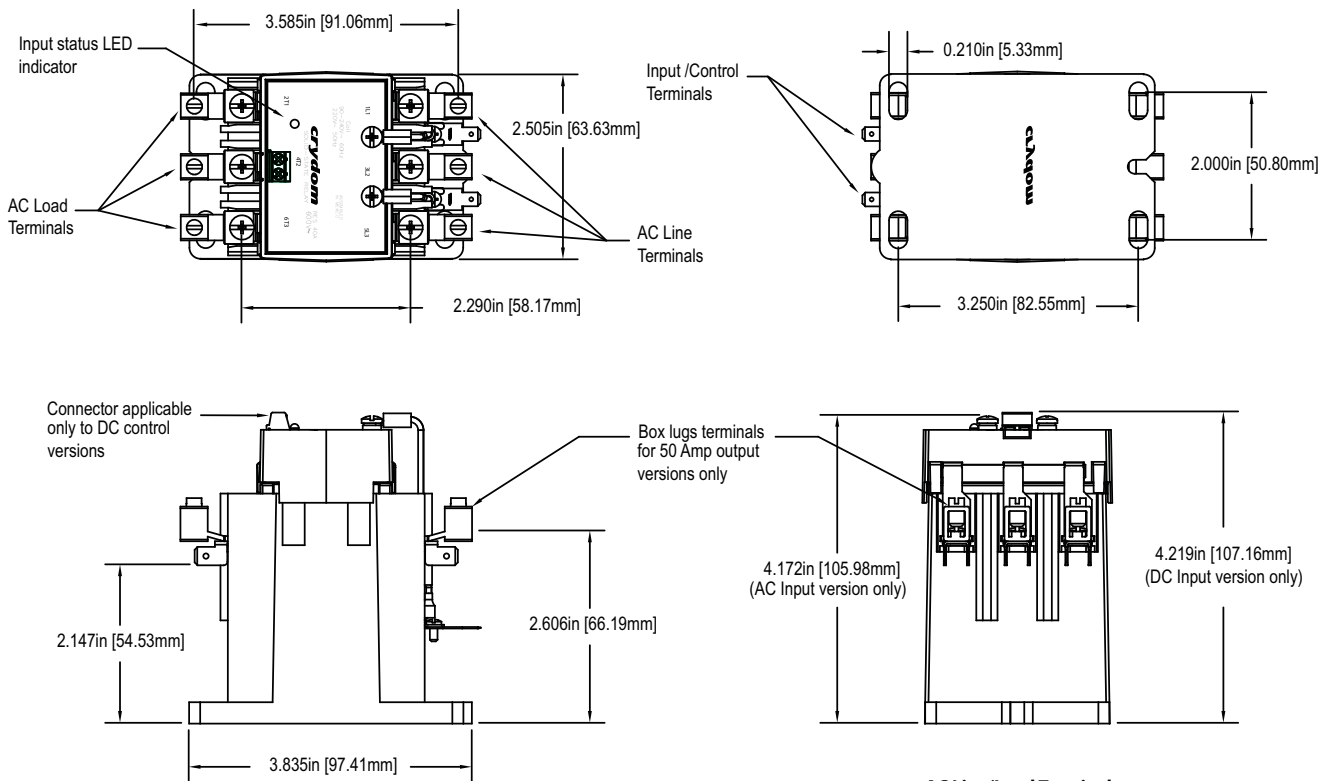


- Ⓞ Match VLL to voltage suffixes 28 & 60 for options E, F & G and 12 & 24 for options DX.
  - Ⓞ The single phase supply voltage must be wired to terminal 1L1 and 3L2 for proper single phase operation.
  - Ⓞ In applications switching two single phase loads (R1 and R2) where the combined load current exceeds the contactor's rating (40 or 50 Amps) the return/neutral lead must not be wired through the contactor (see above drawing).
- Caution: Risk of overheating. Do not allow any single phase connection to exceed the current rating of the relay. Failure to follow these instructions may result in equipment damage.**

Other Crydom products and competitive part number cross-reference available at: [www.crydom.com](http://www.crydom.com)

## Mechanical Dimensions

(Tolerances:  $\pm 0.02$  in / 0.5 mm)



- **AC Line/Load Terminals**  
#10-24 screws or .25in x .032in Dual Fast-On  
(Box lugs available on 50 Amps version only)
- **Input/Control Terminals**  
#8-32 screws or .25in x .032in Fast-On

## Accessories



**DIN rail bracket**

Part Number DMB3

Description DIN Rail mounting adaptor kit



**Auxiliary contact**

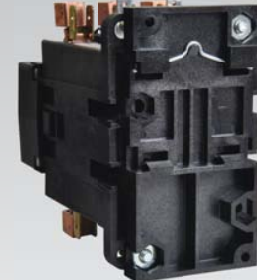
HAC1

Includes one normally open & one normally closed contact, each rated @ 5 Amps rms, 600 VAC, 50/60 Hz 2.5 in Quick Connect



**Mounted auxiliary contact**

Note: 3RHP accommodates one or two HAC1 auxiliary contacts



**Mounted DIN rail bracket**

Questions? Call or e-mail

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## Single Phase Contactor 20 Amp

90-250 VAC

- Combined SSR and EMR advantages
- Lifetime >5 million operations @ full load
- No heat sink required
- Input status LED indicator
- Quiet operation
- 17.5 DIN rail mount or panel mount
- CE & RoHS compliant, UL/cUL listed
- US Patent No. 6, 347, 024 B1

### OUTPUT SPECIFICATIONS ①

	1RHP2520D32	1RHP2520A
Operating Voltage (50/60Hz) [VAC]	90-250	90-250
Maximum Load Current (Resistive only) [Arms]	20	20
Minimum Current [mA rms]	100	100
Maximum Off-State Leakage Current [mA rms]	5	5

### INPUT SPECIFICATIONS ①

	1RHP2520D32	1RHP2520A
Control Voltage Range	4-32 VDC	90-250 VAC
Maximum Input Current	30 mA DC	4.85 mA rms
Minimum Input Current	2.3 mA DC	1.65 mA rms
Drop out Voltage	1 VDC	46 VAC

### GENERAL SPECIFICATIONS ①

Contacts (Single Break)	N.O. (Normally Open)
Ambient Operating Temperature Range	-5 to 70°C
Ambient Storage Temperature Range	-40 to 85°C
Max. Turn-On Time	16.6 mS @ 60 Hz / 20 mS @ 50 Hz
Max. Turn-Off Time	32 mS @ 60 Hz / 40 mS @ 50 Hz
Maximum Number of Operations per minute	20/min
Lifetime Number of Operations	>5 Million
Terminal Torque	8.85 in lb (1 Nm) max
Acoustic noise ON position	<35 dB @ 3.2 ft (1 m)
Acoustic noise switching	<50 dB @ 1.6 ft (0.5 m)
Weight (typical)	70 gr
Terminal capacity	2 x AWG #14 with ferrule and 2 x AWG #12 without ferrule

① Specifications @ 25°C unless otherwise noted.

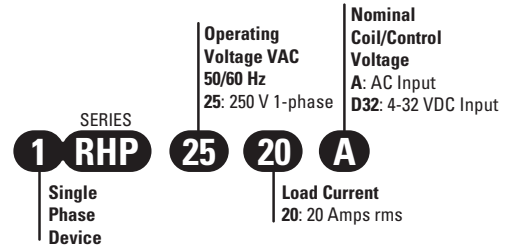


Operating Voltage	Load Current	Control Voltage	
VAC 50/60 Hz	Amps rms	VDC	
<b>1RHP2520D32</b>	20	4-32	UL, cUL

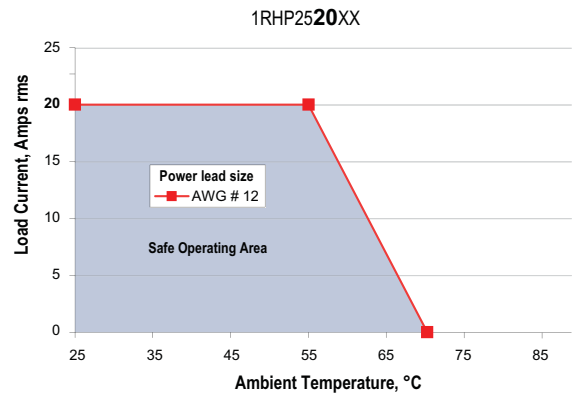


Operating Voltage	Load Current	Control Voltage	
VAC 50/60 Hz	Amps rms	VAC 50/60 Hz	
<b>1RHP2520A</b>	20	90-250	UL, cUL

### Part Number Nomenclature

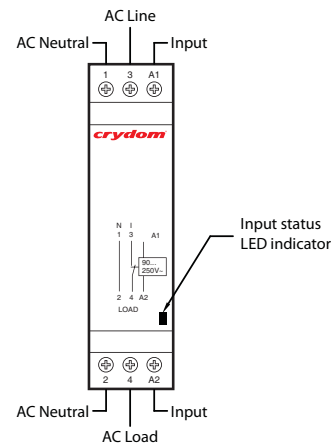
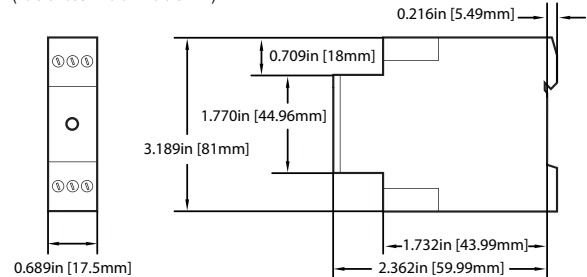


### Derating Curve



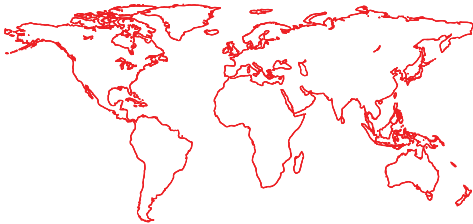
### Mechanical Dimensions

(Tolerances: ± 0.02 in / 0.5 mm)



Other Crydom products and competitive part number cross-reference available at: [www.crydom.com](http://www.crydom.com)

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Across the Globe



Crydom is an operation of Custom Sensors & Technologies (CST), a business unit of Schneider Electric.

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